

What is claimed is:

1. A method of the gasification of coal using oxygen and steam,
wherein the coal is gasified at a temperature of from 1000 to 2500 °C
and a pressure of from 1 to 100 kg/cm² using oxygen generated by
5 electrolyzing water and steam heated to a temperature of from 300
to 600 °C through a heat exchange with high-temperature gas from
the coal gasifier.
2. The method according to claim 1, wherein hydrogen generated by
the water electrolysis is mixed with the gas generated by the
10 gasification whereby a gas mixture is produced.
3. The method according to claim 1 or 2, wherein oxygen is introduced
in an amount of 0.3 to 1.1 times as much as a required molar amount
of oxygen calculated by subtracting a molar amount of oxygen in
the feed coal from a half of the molar amount of carbon in the
15 feed coal.
4. The method according to any one of claims 1 to 3, wherein the steam
is introduced in an amount of 0.15 to 0.6 time as much as a weight
of the coal used in the gasification.
5. The method according to any one of claims 1 to 4, wherein the
20 gasification is performed at a pressure of from 15 to 80 kg/cm².
6. The method according to any one of claims 1 to 5, wherein pulverized
coal is supplied to gasification reactor by a pneumatic
transportation method using carbon dioxide, nitrogen, or hydrogen,
or by a water slurry method.
- 25 7. A method of the gasification of coal using steam, wherein the coal
is gasified at a temperature of from 1000 to 2500 °C and a pressure
of from 1 to 100 kg/cm² using steam having a temperature of from
2,000 to 2,700 °C, which steam is prepared by reacting hydrogen
with oxygen, both hydrogen and oxygen being generated by
30 electrolyzing water.

8. The method according to claim 7, wherein oxygen is introduced in an amount of 1 to 1.5 times as much as a required molar amount of oxygen calculated by subtracting a molar amount of oxygen in the feed coal from a half of the molar amount of carbon in the feed coal.
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9. The method according to claim 7 or 8, wherein hydrogen is introduced in an amount of from 2 to 3 times as much as a required molar amount of oxygen calculated by subtracting a molar amount of oxygen in the feed coal from a half of the molar amount of carbon in the feed coal.
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10. The method according to any one of claims 7 to 9, wherein the temperature of steam is in the range of from 2000 to 2700 °C.
11. The method according to any one of claims 1 to 10, wherein the electrolysis of water is carried out using an electric power generated by wind power, waterpower, or the solar energy.
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12. The method according to claim 11, wherein at least a sufficient amount of oxygen or at least sufficient amounts of oxygen and hydrogen for the 24 hours operation of coal gasification is produced in the electrolysis of water.